

CLAIMS

1. A plunger type master cylinder comprising a cylinder housing having a cylinder bore axially extending from a first end part which is open and a second end part which is closed and a communication passage which is communicated with a reservoir, a piston fitted into said cylinder bore of said cylinder housing, defining a fluid pressure chamber on the side of said second end part which is closed and axially movable, a seal ring located on the side of said cylinder housing, adapted to seal an outer periphery of said piston, and including an inner lip and an outer lip extending from a base part and an inner and an outer peripheral part of said base part to the side of said fluid pressure chamber, respectively, and a relief port serving as a passage which is located on the side of said piston and adapted to intercommunicate said communication passage and said fluid pressure chamber, an opening of said passage being located at an outer peripheral wall surface of said piston,

said plunger type master cylinder having the following features;

feature 1. A recess is formed on an outer peripheral surface of said piston ranging , when axially viewed, at least from a second edge on the side of said second end part of said opening of said relief port to a first edge on the side of said first end part of said opening of said relief portion, further ranging to an area away by a predetermined distance from said first edge of said opening of said relief portion toward said first end part side, and further ranging over the entire length in a peripheral direction of said

piston.

feature 2. Said inner lip of said seal ring is smaller in diameter at a distal end part as a free end thereof than at a root part on said base part side, thereby said seal ring has a seal coupling part situated at an inner periphery of the distal end part of said inner lip which is small in diameter which is seal-coupled to an outer peripheral wall surface of said piston and adapted to seal-coupled to an outer peripheral wall surface of said piston, and moreover, a void for communicating said relief portion with said communication passage together with said recess is formed between an inner periphery of said inner lip ranging from said seal coupling part to said root part.

feature 3. Said seal coupling part of the distal end part of said inner lip of said seal ring is axially located at the opening part of said relief port on the side of said piston when said master cylinder is in a non-operating position.

2. The master cylinder according to claim 1, wherein said seal coupling part of said inner lip of said seal ring traverses the edge of said opening of said relief port only at an area on the side of said first edge so as to be seal coupled to the outer peripheral wall surface of said piston which is nearer to said first end part from said first edge, in accordance with operation of said master cylinder.

3. The master cylinder according to claim 1 further having the

following feature 4;

feature 4. Said seal ring comprises a plurality of first projection parts formed on an inner peripheral surface of said inner lip between said root part and said seal coupling part and bulged from the inner peripheral surface of said inner lip toward the outer peripheral surface of said piston, and said first protection parts are spacedly arranged in the peripheral direction, thereby forming an axial flow passage between said first projection parts which are adjacent to each other in the peripheral direction.

4. The master cylinder according to claim 3, wherein said seal ring further comprises a plurality of second projection parts located on the inner peripheral surface of said inner lip and nearer to the base part from said first projection parts, and said second projection parts are also arranged in the peripheral direction, thereby forming an axial second flow passage between said second projection parts which are adjacent to each other in the peripheral direction.

5. The master cylinder according to claim 4, wherein said first and second projection parts are arranged such that their projection parts are not overlapped with each other when viewed in the axial direction.

6. The master cylinder according to claim 1, further having the following features 5;

feature 5. Said seal ring is deformable such that said inner lip is oscillated radially inward and outward about said root part, said base part, said base part is provided at an inside surface on the side where said inner and outer lips extend with a swollen part for enlarging the axial thickness of said base part on the inner lip side compared with the outer lip side, and the center of oscillation of said inner lip is located in a position nearer to the second end part side in the axial direction than in a case where no swollen part is provided.

7. The master cylinder according to claim 1, wherein said seal coupling part is composed of an convex part which is formed over the entire periphery of the distal end part of said inner lip.

8. The master cylinder according to claim 1, wherein the outer peripheral wall surface of said piston to which said seal coupling part is seal coupled, is located between a part situated in said recess formed in the outer periphery of said piston and a part nearer to said first end part from said recess.

9. The master cylinder according to claim 1, wherein said cylinder housing is provided, when viewed in the axial direction, at a front and a rear part of said recess formed in said piston with portions for guiding movement of said piston.

10. The master cylinder according to claim 1, wherein an attachment

groove for attaching said seal ring is formed in an inner peripheral wall surface of said cylinder bore of said cylinder housing, and said seal ring is located in said attachment groove with said base part sunk in said attachment groove and with said seal coupling part at the inner periphery of the distal end part of said inner lip projecting outward from said attachment groove.